Motorola and Honeywell sign on MRAM

Honeywell and Motorola have signed a technology agreement for Motorola to provide Honeywell access to its magneto-resistive random access memory (MRAM) non-volatile memory chip technology.

The agreement is expected to accelerate Honeywell's ability to develop radiation-hardened MRAM non-volatile memory for military and aerospace products, such as satellites where data processing and storage performance is critical.

Honeywell plans to incorporate Motorola's MRAM memory elements with its radiation-hardened silicon-on-insulator (SOI) technology to produce the first memory chip capable of providing data stability in the harsh operating environments of space, including for satellite and military applications.

"Combining Motorola's MRAM with Honeywell's Silicon-On-Insulator (SOI) radiation hardened process will produce a new, revolutionary chip that improves data storage," said Eric Doremus, VP of Honeywell's precision sensors and components business.

"This is a breakthrough component that will result in greater reliability of data despite varying radiation and power fluctuation challenges in space environments."

Honeywell and Motorola collaborated with Defense Advanced Research Project Agency in the initial research and development of MRAM. Currently RAM used in space and military systems is susceptible to the bursts of high or low amounts of radiation that interrupt power, requiring auxiliary systems to prevent data- corruption and loss.

By contrast, MRAM stores data through a magnetic cell structure rather than through transistor cells, eliminating the need for the auxiliary systems that add weight, require storage and often are less reliable. MRAM offers exceptional speed, memory ability and the integration of multiple memory-options on the same chip and allows programs and data to remain in local memory even if the computer is turned off, significantly reducing load time on power up.

Polymer & metal oust silicon

Researchers at University of Missouri - Rolla and Motorola Inc's Advanced Technology Center in Schaumburg, Illinois, are developing 3D switches and fuel cells to improve the reception quality and extend the operating time for communications and wireless sensing devices.

Dr. Matthew O'Keefe, associate professor of metallurgical engineering and a leader of this research says use of Meso-MEMS as switches will mprove reception quality, and save energy. O'Keefe and Dr. James Drewniak are working with Dr. Keryn Lian of Motorola Labs.

Over four years the Defense Advanced Research Project Agency (DARPA) and the Department of Defense (DOD) have contributed $2.6m towards the research. O'Keefe, Drewniak and researchers s have worked directly with Motorola's Advanced Technology Center and the Air Force Research Laboratory at Dayton, Ohio, to develop small RF switches.

Meso-MEMS switches work like a light switch, either on or off, unlike current solid state technology, which is on at some level all the time. Advantage to using a switch is as it does turn off, it saves energy. Energy savings are also realised with current MEMS switches made of silicon, but silicon RF MEMS switches are relatively expensive, O'Keefe says.

The Motorola /UMR team discovered that alternative polymer and metal materials work just as well as silicon, for a much lower price. In the next phase of the program the researchers will be developing fuel cells to power the wireless devices, providing power for longer than traditional batteries.